METHOD AND APPARATUS FOR PROVIDING ADDITIONAL INFORMATION TO A SELECTIVE CALL DEVICE ABOUT A BROADCAST

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a divisional of pending U.S. application Serial Number. 09/630,326, filed July 31, 2000, and assigned to Motorola, Inc.

Field of the Invention

This invention relates in general to selective call communication systems and devices, and broadcast systems, and in particular to a method and apparatus for providing additional information to a user of a selective call device about a broadcast presented on a broadcast receiver that is of interest to a user of the selective call device.

Background of the Invention

Selective call communication devices such as pagers using present day technology have the capability of receiving information (e.g., advertisements, news, sports information, and other types of information) besides the traditional personal messages received by pagers. One type of such non-personal message information, described herein simply as additional information, could be of benefit to advertisers who advertise using broadcast systems, such as commercial television systems. Advertisers would typically benefit if additional information could be gotten to persons who view presentations of advertisements on television sets or receive advertisements on broadcast radio receivers, if the additional

information, or a method to obtain the additional information could be provided immediately, inexpensively to the user and advertiser, and without significant effort on the part of the user.

U. S. Patent 5,752,186 issued to Malackowski et al. on May 12, 1998, entitled "ACCESS FREE WIRELESS TELEPHONY FULFILLMENT SERVICE SYSTEM" describes methods in which a mobile telephone caller receives additional information relevant to a radio broadcast or other advertisement. In a first method, the caller perceives an access code, for example, on a billboard or in a radio broadcast. The caller then initiates a telephone call using an access telephone number (perhaps also transmitted in the broadcast or listed on the billboard), and by using the access code, obtains additional information relevant to the billboard or broadcast. In a second method, the caller's mobile telephone receives the access code from a roadside transmitter or radio broadcast, and automatically initiates a telephone call to receive the information. It will be appreciated that, in the first method, the caller must remember or note down numbers and use them to obtain the information, making it complicated for the caller. In the second method, all such access codes are automatically used to initiate a telephone call, making it expensive for the caller or the service supplier or the advertiser, or a combination of the three. In both instances, it will be appreciated that a telephone call is initiated by each caller obtaining the information, and that each response is uniquely conveyed to the caller, again making it expensive for the caller or the service supplier or the advertiser, or a combination of the three. Such an approach can provide additional information to the caller but does not typically achieve all of the objectives listed above.

What is needed, then, is a technique that provides additional information to a person who perceives a broadcast presentation of interest, and that achieves more of the objectives of being immediate, inexpensive, and simple for the user.

Brief Description of the Drawings

FIG. 1 shows a block diagram of a two-way paging system and a broadcast television system, in accordance with the preferred embodiment of the present invention.

FIG. 2 shows a block diagram of a television set, in accordance with the preferred embodiment of the present invention

FIG. 3 is a front view of a television set that is presenting a commercial broadcast, in accordance with the preferred embodiment of the present invention.

FIG. 4 shows a block diagram of a receiver of the television broadcast system, in accordance with the preferred embodiment of the present invention.

FIG. 5 is a timing diagram of a prompt presented during the broadcast and an information address signal transmitted during the broadcast, in accordance with the preferred embodiment of the present invention.

FIG. 6 is a timing diagram of the broadcast and prompt presented by the television broadcast receiver and a message transmitted by a fixed network of the selective call communication system, in accordance with the preferred embodiment of the present invention.

FIG. 7 is an electrical block diagram of a subscriber unit, in accordance with the preferred embodiment of the present invention.

FIGs. 8 and 9 are a flow chart of a method used in a broadcast system and a selective call communication system to provide additional information about a

broadcast presentation, in accordance with the preferred embodiment of the present invention.

FIGs. 10 and 11 are a flow chart of an optional method of acquiring the information address by the subscriber unit, in accordance with the preferred embodiment of the present invention.

FIG. 12 is a block diagram of a remote control unit used in the method described with reference to FIGs. 10 and 11, in accordance with the preferred embodiment of the present invention.

FIGs 13 and 14 are flow charts of a method to control a prompt mode of the television set, in accordance with the preferred embodiment of the present invention.

FIG. 15 is an electrical block diagram of the television set, showing additional functions that make it possible for the television set to receive a command signal from the remote control unit described with reference to FIG. 12, in accordance with the preferred embodiment of the present invention.

FIG. 16 is a flow chart is shown of a method to determine a prompt mode of the television set by a location, in accordance with the preferred embodiment of the present invention.

FIG. 17 is an electrical block diagram of a television set that determines the prompt mode from a location, in accordance with the preferred embodiment of the present invention.

Description of the Preferred Embodiment

Referring now to the drawings and in particular to FIG. 1, a two-way paging system **100** and a television broadcast system **106** are shown, in accordance with the preferred embodiment of the present invention. The two-way paging system

100 is representative of one and two way wide area selective call radio communication systems that include paging systems, cellular radio systems, and mobile radio systems, and accordingly, the pagers used in the two-way paging system are representative of one and two way selective call devices such as one and two way pagers, cellular and personal communication system telephones, personal digital assistants having wireless modems, and mobile radios. The two-way paging system **100** is a wide area radio selective call communication system that uses the well known FLEX™ signaling, and comprises a fixed network that includes a transmitter/receiver **114** and a plurality of pagers including pagers **110, 111, 112, 113.** A discussion of the FLEX communication protocol for example can be found in U.S. Patent 5,555,183 entitled "Method and Apparatus for Synchronous Selective Call Signal", which is hereby incorporated by reference. It will be appreciated that the wide area radio selective call communication system of which the paging system **100** is representative would typically comprise a plurality of transmitter/receivers **114** and/or separate transmitters and receivers. The plurality of pagers used in the wide area selective call communications system **100** includes at least one unique pager such as one of the pagers **110, 111, 113** and can include one or more conventional pagers such as pager **112.** One of the unique pagers **110** is out of range of the television broadcast system **106** in this example. Another of the unique pagers **113** is not near a broadcast receiver such as broadcast receiver **109.** These two unique pagers, **110, 113** cannot make immediate use of all the functions of the present invention, but they may benefit by previously having been near a broadcast receiver that was in range of the broadcast system **106.** Because the other unique pager **111** is within range of both the two-way paging system **100** and is also within the range of a signal produced by a television set **109**

of the television broadcast system **106**, the other unique pager **111** can provide all the advantages of the present invention essentially without delays that will typically occur for pagers near television set **108** that are out of range of the two-way paging system **100**.

The television broadcast system **106** is representative of broadcast systems that include television and radio broadcast and cable systems. The television broadcast system **106** comprises an infrastructure that includes a conventional television broadcast transmitter **120** and a plurality of conventional television sets, of which two television sets **108**, **109** are illustrated in FIG. 1. A broadcast signal **122** is radiated in an essentially uniform manner within a television coverage boundary of the television broadcasting system **106**, and is intercepted by the television sets **108**, **109**. In a cable broadcasting system, the broadcast signal is broadcast by cable to television sets that subscribe to the cable service, in a conventional manner. The broadcast signal **122** is a radio frequency signal that carries a broadcast that comprises an audio portion, a video portion, and in some instances an ancillary portion. The broadcast signal **122** is generated by conventional modulation and amplification circuits of the transmitter/receiver **120**, and is therefore referred to herein as a standard television signal because the broadcast signal **122** meets national standard for television signals, such as FCC standards for conventional "NTSC" broadcasts, or the ATSC Digital Television Standard promulgated by the Advanced Television Systems Committee in the United States of America, but the national standards would be different in many other countries. The audio, video, and ancillary portions of the broadcast according to the present invention are conventional in some aspects and unique in other aspects. They are conventional in that the signals comprising each portion are

within standard parameters defined by the standards for the portions, such as bandwidths specified for the signals, but they are unconventional as to the information that is included in each signal.

The television sets **108, 109** comprise one or more television receivers, as illustrated in FIG. 2. In the electrical block diagram shown in FIG. 2, the television set **109** comprises an internal television receiver **250** and a set-top cable box **255** that is also called a television receiver for the purposes of this description. Both the internal television receiver **250** and the set-top cable box **255** are receivers of television signals that meet a broadcast standard or standards. One of the receivers **250, 255** is selected by a selector **260** that is controlled by a user in a conventional manner. The selected receiver **250, 255** converts either a radio frequency (RF) signal **249** that is intercepted by a TV antenna **245** or a cable (RF) signal **254** that has been generated by a TV cable system operator and conducted to the set top cable box **255** by a cable. The selected receiver converts the intercepted RF signal **249** or the cable RF signal **254** to a TV monitor audio/video signal **251, 256** that is coupled to a conventional TV monitor **265** for presentation to a viewer. When one of the RF signals **249, 254** includes an ancillary portion and the associated TV monitor audio/video signal **251, 256** has been selected by the selector **260**, the associated receiver **250, 255** extracts information as described in more detail below from it and generates a first short range wireless (SRW) signal **270**, described more fully below.

Referring now to FIG. 3, a front view of the television set **109** is shown, in accordance with the preferred embodiment of the present invention. In this example, the television set **109** is presenting a broadcast that is a TV commercial of 30 seconds duration. During a significant portion of the duration of the TV

commercial (e.g., enough time for most viewers to see and react to it, such as 15 seconds), a prompt **220** is shown on the video portion of the broadcast. In this example the prompt **220** is located in the lower right hand corner of the TV screen **210**. The prompt **220** is a well-known symbol or icon that indicates to the viewer that of the TV commercial that additional information concerning the subject of the TV commercial is available. The prompt **220** in this example is a well-known trademark, the FLEX signaling trademark that indicates to the user that the additional information is available by use of a FLEX communication system. The prompt **220** is preferably shown within the TV commercial beginning at the start of the commercial, or shortly thereafter, and is retained in the commercial until the end of the commercial. It will be appreciated that a unique aspect of the prompt **220** is that its symbolism is not necessarily related to the subject matter of the TV commercial, but rather it is related to the method to use for obtaining more information related to the subject matter of the TV commercial. During the TV commercial the audio portion of the broadcast is presented to the viewer as sound **230** (also described herein as the audio presentation) emanating from TV loudspeakers. The audio presentation comprises conventional speech and/or music, which are chosen to inform the viewer about the product being advertised. In accordance with the preferred embodiment of the present invention, the first short-range wireless (SRW) signal **270** is emitted by the television set **109** substantially simultaneously with the TV commercial. This first SRW signal **270** is preferably a two way radio signal that meets the Bluetooth standard ("Specification of the Bluetooth System", version 1.0 draft, July 5, 1999) and includes an information address **320** (described below with reference to FIG. 5) in its transmitted signal, but alternatively could be other types of short range communications signals, such as an infrared signal that meets InfraRed Data

Association (IrDA) standards such as the IrDA Command and Control Standard, the IrDA Infrared Communications Protocol, and the IrDA Infrared Tiny Transport Protocol, or a sound signal, either audible or superaudible, that includes the information address 320.

Referring now to FIG. 4, an electrical block diagram of the receivers **250**, **255** is shown, in accordance with the preferred embodiment of the present invention. One of the RF signals **249, 254** is coupled to an RF signal demodulator **280** of one of receivers **250, 255** that converts and demodulates the RF signal **249, 254**, generating a digital signal. An MPEG2 decoder **283** then decompresses the original signal. The decompressed digital signal is coupled to an audio/video decoder **286** that generates one of the audio/video signals **251** (receiver **250**), **256** (receiver **255**) that is coupled in a conventional manner to the TV monitor **265**. The decompressed digital signal is also coupled to an ancillary signal decoder **289** that uniquely extracts the information address **320** and couples it to a first SRW signal generator **290**, that is shown in FIG. 4 as a Bluetooth transmitter/receiver, which transmits the first SRW signal **270**. In an implementation in which the first SRW signal **270** is an IrDA signal, the first SRW signal generator **290** can be an IrDA transmitter/receiver. In an implementation in which the first SRW signal **270** is a (one way) sound signal, the first SRW signal generator **290** can be a television speaker.

Referring to FIG. 5, a timing a diagram of the first SRW signal **270** transmitted by the television set **109** during the TV commercial is shown, in accordance with the preferred embodiment of the present invention. This first SRW signal **270** is an information address signal **305** that in this example comprises four bursts of an information address **320** that includes a FLEX protocol position

identifier, plus redundant bits added for error protection. Each of the FLEX protocol position identifiers comprises 48 bits of information, which is sufficient to uniquely identify a FLEX protocol position within a one-day period, provide other information, and provide for error correction. For example, for the protocol position identifier, five bits are used to identify the hour, four bits are used to identify the cycle, seven bits are used to identify the frame, four bits are used to identify the block, and five bits are used to identify the word at which the additional information starts. The 13 bits that are not used for protocol position identifiers are used for error correction and detection in a conventional manner. The address information and the 13 error correction and detection bits are preferably embedded within the standard Bluetooth protocol.

The information address signal **305** occurs during the broadcast, which in this example has a duration **330** of 30 seconds. The prompt **220** in this example starts 4 seconds after the start of the broadcast, at a time referred to herein as the prompt start time **335**, and is presented from the prompt start time **335** to the end of the broadcast. The information address signal **305** starts after the prompt start time **335**; in this example starting 12 seconds into the broadcast. This delay after the prompt start time **335** allows users to react to the prompt **220** and activate their pagers **111** prior to the start **340** of the first SRW signal **270**. It will be appreciated that the number of repetitions of the information address **320** and the error protection bits that are used in the first SRW signal **270** can be changed without changing a fundamental aspect of the invention, which is to include the information address **320** in the first SRW signal **270** in a reliable manner and to transmit the first SRW signal **270** at times following the prompt start time **335** that are judged to optimize a reception by an electronic device activated by a user in response to the

prompt; as few as one transmission of the information address **320** could be sufficient in certain circumstances.

Referring again to FIG. 1, the video presentation is viewed by a user of the pager **111**, who sees the prompt **220** and has an interest in further information about the TV commercial being presented. The user presses a control button on the pager **111** that activates a first SRW signal **270** receive mode of the pager **111**. A Bluetooth transmitter/receiver (or infrared transmitter/receiver in the case of IrDA, or microphone, in the case of a sound signal) in the pager **111** intercepts and decodes the first SRW signal **270**, generating the information address **320**. The information address is stored in the pager **111**. In accordance with the preferred embodiment of the present invention, the pager **111** then automatically interprets the information address **320** and when the information address is a protocol position indication, the page **111** decodes a message **510** (see FIG. 6) that is transmitted by the fixed network of the two-way paging system **100** beginning at the protocol position indicated by the protocol position identifier in the information address **320**. Information in the message is accepted by the pager **111**; this is some or all of the additional information associated with the TV commercial whose availability is indicated by the prompt **220**. In accordance with the preferred embodiment of the present invention, the information address **320** can alternatively be a uniform resource locator (URL) that is used by the pager **111** to obtain the additional information either automatically or at a command of the user of the pager **111**.

Referring to FIG. 6, a timing diagram of the broadcast and the message **510** is shown, in accordance with the preferred embodiment of the present invention when the information address is a protocol position indicator. The duration **330** of

the broadcast and the prompt start time **335** are shown on the lower axis of FIG. 6. The message **510**, shown on the upper axis of FIG. 6, starts at a message start time **520**. It will be appreciated that the message **510** must start after the prompt start time **335** for the message **510** to be effective. The transmission schedules for the message **510** and the prompt **220** are preferably arranged such that the message start time **520** follows the end of the last complete burst **320** of the information address signal **305**. This allows the message **510** to be sent once and received by the pager **111** even in the event the user waits until near the end of the broadcast to activate the information address receive mode, when the information address is a protocol position indicator. For some types of broadcasts, the advertiser or other party may provide the additional information a single time. For other types of broadcasts, the advertiser or other party schedules a follow on message **530**, or a plurality of such messages **530**, that are sent periodically or at times indicated by the protocol position indicator. As an example, availability of tickets for a concert can be updated every 6 or 12 hours until the time of the concert. In this case, the information address **320** may be longer, in order to include in the protocol position identifier a protocol position for the message start time **520** as well as a period (e.g., number of FLEX™ frames) at which the message **530** will be repeated, or a plurality of protocol positions.

As described above, the additional information can alternatively be stored by the advertiser at a location in a computer network identified by a uniform resource locator (URL). In this case the information can be retrieved immediately or any later time until the advertiser removes it.

It will be appreciated that the audio and video portions of the broadcast are generated by or for an advertiser or other party using video and audio mixing

techniques conventionally used by commercial television program producers, resulting in an electronic recording of the broadcast that is scheduled for transmission at a predetermined time with the broadcaster by the advertiser or other party. The advertiser or other party has a choice of to methods of delivering the additional information. In one, the advertiser or other party also schedules with an operator of the two-way paging system **100** for transmission of the message **510** at a time relative to the scheduled transmission time of the prompt that allows the user to acquire the additional information quickly and easily, as described above with reference to FIG. 6, and allows the advertiser or other party to minimize the costs of getting the additional information only to interested users, by avoiding unnecessary repeated transmissions of the additional information. In the other, the advertiser or other party places the additional information at a location in a computer network accessible by a URL.

Referring to FIG. 7, an electrical block diagram of a multichannel subscriber unit **600** is shown, in accordance with the preferred embodiment of the present invention. The subscriber unit **600** is representative of one or two-way pagers **110, 111, 113**. The subscriber unit **600** comprises a transmitter/receiver (transceiver) **615** and a controller **650**. A conventional antenna **610** intercepts radiated radio frequency (RF) signals **605** that are converted by the antenna **610** to conducted RF signals that are coupled to the receiver **615**. The transceiver **615** performs conventional receiving functions of filtering unwanted energy from the RF signal, converting the RF signal, and generating a demodulated signal **620** that is coupled to the controller **650**, using a conventional phase lock loop **616** to generate a local oscillator signal. The transceiver **615** also performs conventional transmitting functions of modulating and RF amplifying a signal emitted by the antenna **610.** The controller **650** generates an input control **617** that is coupled to the phase lock

loop **616**. The controller **650** is also coupled to a display **624**, an alert **630**, a set of user controls **640**, an short range wireless (SRW) signal receiver/transmitter **645**, and an electrically erasable read only memory (EEPROM) **626**. The controller **650** comprises a microprocessor **660**, as well as other circuits not shown in FIG. 7, such as power regulation circuits. The controller **650** is also coupled to the receiver **615** by a power control signal **618** that switches the receiver off during certain frames when the controller **650** has the transceiver **615** tuned to a home channel. This is for conventional battery savings purposes. The SRW signal receiver/transmitter **645** receives, demodulates, and decodes first SRW signals **270**, and encodes, modulates, and transmits other SRW signals needed for protocol acknowledgments, for example. The SRW receiver/transmitter **645** is controlled by the controller **650** to communicate using the standard Bluetooth protocol, and receives the information address signal **305**, which is processed by the controller **650**. In the case of an IrDA first SRW signal **270**, the SRW receiver/transmitter **645** is an infrared receiver, and in the case of a sound SRW signal, the SRW receiver/transmitter **645** is a microphone (i.e., there is no transmitter). The microprocessor **660** is coupled to the EEPROM **626** for storing an embedded address, the information address **320**, and other configuration information that is stored therein during normal or maintenance operations. The microprocessor **660** is a digital signal processor of conventional circuit design, comprising a central processing unit (CPU) **661**, a read only memory (ROM) **662**, and a random access memory (RAM) **663**. In certain embodiments, the transceiver **615** need be only a receiver.

A conventional message processor function of the microprocessor **660** decodes an outbound selective call message, generating data words that have

been coded within an outbound signaling protocol conveyed by the radio signal **605,** and processes an outbound personal selective call message when an address received in an address field of the outbound signaling protocol matches the embedded address stored in the EEPROM **626,** in a manner well known to one of ordinary skill in the art for a subscriber unit. An outbound personal selective call message that has been determined to be for the subscriber unit **600** by the address matching is processed by the message processor function according to the contents of the outbound message and according to modes set by manipulation of the set of user controls **640,** in a conventional manner. An alert signal is typically generated when an outbound personal selective call message includes user information. The alert signal is coupled to the alert device **630,** which is typically either a conventional audible or a silent alerting device. When the pager **111** is a two-way pager (or, for example, a cellular radio), acknowledgment and other inbound signals are transmitted by the transceiver **615.**

The subscriber unit **600** is preferably a conventional model Pagewriter™ 2000 pager made by Motorola, Inc. of Schaumburg, IL, except that firmware in the ROM **662** is modified to have unique segments of firmware comprising unique combinations of conventional programming instructions that control the CPU **661**, and therefore the controller **650** and the subscriber unit **600**, to perform the unique message receiving operations described herein, in particular with reference to FIGs. 1-6, and also in FIGs. 8 -17. It will be appreciated that, in accordance with the preferred embodiment of the present invention, the subscriber unit **600** can simultaneously receive the first SRW signal **270** and a message **510** or a personal selective call message, because the subscriber unit **600** has a separate receiver for each signal and the controller operates fast enough to demodulate the first SRW

signal **270** and decode the information address**320** while decoding a personal selective call message or the message **510**. The subscriber unit **600** can alternatively be a modified version of one of many different conventional models of selective call radios that are designed to operate on a FLEX™ or ReFLEX™ communication system. In the subscriber unit **600**, the information signal receiver **645** is a preferably a Bluetooth transmitter/receiver. For those selective call radios that are controlled by a CPU, their programming instructions must be modified to provide the unique functions described herein. For others that are state machines, which share the characteristics of the subscriber unit **600** of having a receiver and a controller, the logic of their controller must be modified to provide the unique functions described herein. The techniques for making such modifications are well known to one of ordinary skill in the art. The description "subscriber unit" is a convenient name for a selective call radio and is not intended to restrict the subscriber unit **600** only to radios for which the service is user paid. For example, the radio may one of many radios owned by a business that operates an entire communication system. It will be appreciated that the unique selective call paging radios **110, 111, 113** can alternatively be two-way subscriber units such as cellular radios, although some features of the present invention may not be practical in some communication systems, such as the use of the protocol position indicator type of information address.

In an embodiment in which the first SRW signal **270** is an infrared signal command, the SRW receiver/transmitter **645** can alternatively be a receiver only, and in an embodiment in which the first SRW signal **270** is carried by sound, the receiver/transmitter **645** is a receiver only. Referring now to FIGs. 8 and 9, a flow chart of a technique used in the subscriber unit **600** to perform the retrieval of

additional information related to a broadcast is shown, in accordance with the preferred embodiment of the present invention. The technique is described in terms of more general communication systems than the television broadcast system **106** and two-way paging system **100**, since the invention is usable in other system combinations (e.g., an frequency modulation (FM) digital radio broadcast system and a personal communication system). At step **705**, in an infrastructure of a broadcast system, a transmitter transmits a broadcast that includes a prompt and the information address **320**. The prompt in a radio broadcast system is preferably a well-known phrase of music or a sequence of well-known audible tones such as the tones that NBC uses. In this instance the prompts are occasionally repeated in during the broadcast instead of being presented continuously. At step **710**, a broadcast receiver of the broadcast system receives the prompt and the information address **320**. The prompt indicates that additional information is available. The information address **320** identifies how the additional information can be received. At step **715** the broadcast receiver presents the broadcast including the prompt.

At step **720** the broadcast receiver transmits a first SRW signal **270** that includes the information address **320**. In accordance with the preferred embodiment of the present invention, the first SRW signal **270** is a signal that meets the Bluetooth standards. In alternative embodiments of the present invention, the information address signal **305** is transmitted using an infrared carrier or an alternative local radio frequency carrier. In these alternative embodiments, conventional techniques are used to modulate the infrared carrier or alternative local radio frequency carrier with the data of the information address **320**, and a

conventional device sensor of appropriate type, plus conventional conditioning circuitry, is used for the information signal receiver **645** of the subscriber unit **600**.

At step **725**, when a user of the selective call device who is watching or listening to a presentation of the broadcast that includes the prompt, and the user understands that the prompt indicates that additional information about the broadcast is available, and when the user has an interest in such additional affirmation, then the user at step **730** activates an SRW signal **270** receive mode (SRWSRM) of his selective call device by manipulating user controls (such as the user controls **640** of the subscriber device described with reference to FIG. 7) of the selective call device in response, at least in part, to the prompt. If the user has no such interest in the additional information then at step **735** the user does not activate the SRWSRM. At step **740**, when the user has activated the SRWSRM, then at step **750** the selective call device receives, decodes, and stores the information address **320** by receiving and decoding the message in the manner as described above with reference to FIG. 7 and storing the information address in the EEPROM **626**, after which the selective call device deactivates the SRWSRM at step **755**. Otherwise, the selective call device does not receive the message, as for example by remaining in a low power mode during the message, and the method ends at step **745**. The information address **320** includes at either a protocol position indication or a URL, and optionally includes an information access code. In an alternative embodiment of the present invention, the user decision at step **735** is replaced by an automatic determination by a prompt sensor of the presence of a prompt. As an example, a pager having a microphone sensor for receiving the information address signal **305** can decode the microphone output to sense a tone sequence used as a prompt in a radio broadcast, as well as the information

address signal **305**. This is an example in which the prompt could be discernable by both a human user and the prompt sensor. In another example, the prompt could be an infrared signal, as is the information address signal **305**, and a common infrared sensor is used for detecting both. The sensing of the prompt by the prompt sensor is activated or deactivated by the user, so the information address signal receive mode is activated, at least in part, in response to the prompt. In this alternative embodiment, the pager **111** preferably temporarily stores only the most recently received information address **320** unless the user commands the pager **111** to more permanently store a currently most recently received information address **320** in the EEPROM **626**, for future use.

When the information address includes a protocol position indicator, then at step **805** a transmitter in the fixed network of the wide area radio selective call communication system transmits a message at one or more scheduled message start times, identified by a protocol position, that is after the prompt start time. The broadcast and message are typically prepared by an advertiser or other party, who schedules the broadcast with the operator of the broadcast system so that the prompt will start at a scheduled prompt time. The advertiser or other party also schedules with the operator of the wide area radio selective call communication system the transmission of the message such that the message start time is not before the prompt start time, and preferably, such that the message start time follows the end of the information address signal **305**. It will be appreciated that these scheduled times must typically be able to be achieved within an accuracy of several seconds or less, but that in modern-day systems such as synchronous selective call communication systems, cellular radio systems, and television or radio broadcast systems, such accuracy is typically achievable. When the information address includes a protocol position indicator, then at step **810** the

selective call device adjusts its receiver channel as necessary and powers itself on beginning at the protocol position indicated by the information address **320** that has been received and stored at step **750**, and thereby receives the message, including information that is expected to be the additional information. In a FLEX™ selective call communication system, the protocol position can be either a start of a frame, wherein, for example, a global message is included, or the protocol position can be an specific frame, block, and word. In a multichannel communication system, the protocol position can also include a receive channel to which the selective call device must adjust itself when it is not already adjusted to the channel.

When the information address includes a URL, then at step **806**, the selective call device transmits a message in the wide area selective call communication system that includes the URL. The selective call communication system, using conventional techniques for retrieving information from a computer network using a URL, retrieves the additional information **320** and transmits it in a message to the selective call device, which receives it at step **811**.

With either type of information address, the selective call device decodes the additional information from the message at step **815**.

In accordance with an alternative embodiment described above with reference to step **750**, wherein the information address **320** includes the optional information access code, the selective call device at step **820** decodes the information access code. Also in accordance with this alternative embodiment, when the decoded information access code matches the stored information access code at step **825**, then the selective call device at step **830** accepts the received information as at least a first portion of the additional information. On the other hand, when the decoded information access code does not match the stored information access code, then the selective call device does not accept the

information address at step **835**. When the optional information access code is not used to control an acceptance of the information address, the information decoded at step **815** is accepted at step **830** when it is sufficiently error free (shown by the dotted line in FIG. 9), in accordance with the standard rules used for decoding messages in the protocol of the selective call communication system. Many advertisers would not wish to restrict the class of users that receive the additional information, but some advertisers and other parties would restrict the class of users that receive the additional information by use of the information access code. The information address **320** is preferably retained in storage in the subscriber unit **600**. The user is given a conventional manual means to review, delete, and select any information address **320** stored in the EEPROM **626** using the user controls **640** and the display **624** of the selective call device. Thus, the user can store a list of such information addresses **320** to collect additional information relevant to several different broadcasts over a period of time, when the messages are transmitted periodically, even though the user (and selective call device) are not near a broadcast receiver. Furthermore, the selective call device is responsive to a command from the selective call communication system for deleting a specific information address **320**.

Referring now to FIGs. 10 and 11, a flow chart of an optional method of acquiring the information address **320** by the subscriber unit **600** is shown, in accordance with the preferred embodiment of the present invention. Steps **1005, 1010, 1015, 1020, 1025**, and **1035** are identical to steps **705, 710, 715, 720, 725**, and **735** described above with reference to FIG. 8. Steps **1030, 1040, 1045,1050**, and **1055** provide the same functions as steps **730, 740, 745, 750**, and **755**, but steps **1030, 1040, 1045, 1050,** and **1055** are performed in a remote control unit

(RCU) **1200** (FIG. 12) that is similar to a conventionally available remote control unit. At step **1105**, the user enters a command for the subscriber unit **600** to acquire the additional information from the remote control unit **1200**, which process the subscriber unit **600** starts by requesting the information address **320** from the remote control unit **1200**. In response, the subscriber unit **600** communicates with the remote control unit **1200** at step **1110**, using a second SRW signal that is generated according to the Bluetooth standard or another short range wireless protocol, and the information address **320** is acquired by the subscriber unit **600** at step **1115**, using the Bluetooth standard or another short range wireless protocol. Then, the subscriber unit **600** acquires the additional information as described above with reference to FIG. 9, steps **805-840**. Alternatively, the information address can be transferred from the remote control unit **1200** to other devices, such as a personal computer or a personal assistant equipped with Bluetooth communicating ability, which can then be used to acquire the additional information when the information address is a URL. In this instance, the remote control device **1200** includes user commands to review, delete, and select information addresses stored therein using the user input/output **1255** of the remote control device **1200**.

Referring now to FIG. 12, a block diagram of the remote control unit **1200** is shown, in accordance with a preferred embodiment of the present invention. The remote control unit **1200** preferably comprises a controller **1230**, a first receiver/transmitter **1205**, a first receptor/emitter **1210**, and a user input **1255**. The controller **1230** comprises a central processing unit **1250** and a memory section **1260** that are implemented using conventional hardware, but in which the memory section **1260** is programmed with a unique set of processing instructions that control the central processing unit (or more simply, the processor) to perform

unique functions as described herein. The remote control unit **1200** can optionally comprise a second receiver/transmitter **1215** and a second receptor/emitter **1220**. The remote control unit **1200** is similar to conventional remote control units in that it includes the user input **1255**, the controller **1230**, and the transmitter portion of the receiver/transmitter **1205**, and it can be used to control the normal functions of one of the television sets **108**, **109,** which will be presumed to be television set **109** for the sake of this description. The remote control unit **1200** preferably controls the television set **109** using a receiver/transmitter **1205** implemented using the Bluetooth technology, and the receptor/emitter **1210** is therefore analyzed as a radio antenna. In addition to controlling the conventional functions of the television set **109**, when the remote control unit **1200** is given inputs from a user by means of the user input/output **1255** that put it into the SRWSRM while a first SRW signal **270** is transmitted by the television set **109**, the remote control unit **1200** receives a first SRW signal **270** from the television set **109**, decodes the information address **320** from it, and stores the information signal **320** in the memory **1260**. (In an alternative embodiment, the remote control unit **1200** can be commanded to all SRW signals **270** and temporarily store only the most recently received information address **320**, unless the user commands the pager **111** to more permanently store a currently most recently received information address **320** in the EEPROM **626**, for future use.) Then, later, the user can control his subscriber unit **600** to communicate with the remote control unit **1200** using the second SRW signal, also preferably using the Bluetooth protocol, to request a transfer of the information address **320** to the subscriber unit **600** using the second SRW signal, for later use to acquire the additional information about the broadcast. In another embodiment of the present invention, the first SRW signal **270** is a sound signal, the

receptor/emitter **1210** is a microphone, and the first receiver/transmitter **1205** is an audio receiver. In this embodiment, the remote control unit **1200** can also comprise an infrared transmitter and emitter (not shown in FIG. 12) that emits conventional one-way infrared commands for controlling television sets. In yet another embodiment of the present invention, the first SRW signal **270** is an IrDA signal, the receptor/emitter **1210** is an infrared sensor and emitter, and the first receiver/transmitter **1205** is an IrDA receiver/transmitter. The second receiver/transmitter **1215** is included when a protocol for transfer of the information address **320** to the subscriber unit **600** may be different than that used for the first SRW signal **270**. It will be appreciated that the controller **1230** of the remote control unit **1200** can alternatively comprise a state machine instead of the central processing unit **1250** and the memory section **1260**.

Referring now to FIGs 13 and 14, flow charts are shown of a method to control a prompt mode of the television set **109**, in accordance with the preferred embodiment of the present invention. At step **1305**, the remote control unit **1200** transmits a command, preferably in the form of a signal generated by the receiver/transmitter **1205,** implemented as a Bluetooth receiver/transmitter. When the command is received by the television set **109**, the television set **109** determines whether the command is a PROMPT ON, PROMPT OFF, or OTHER command at step **1310.** When the command is a PROMPT ON or PROMPT OFF command, the television set **109** sets the prompt mode to the corresponding state at one of the steps **1320, 1330** (if it is not already so set). When it is another type of command, the television set **109** executes the other type of command at step **1315.** After steps **1315, 1320, and 1330**, the television set **109** awaits another user command at step **1305**. At step **1325** (FIG. 14) a broadcast is received with a

prompt that indicates that additional information is available concerning the broadcast, and the information address is also received, as described herein above. When the prompt mode is ON at step **1340**, the prompt is presented on the television monitor, essentially "on top of" a portion of the broadcast video at step **1345**, and the first SRW signal **270** is transmitted shortly after the start of the presentation of the prompt at step **1350**. After steps **1345** and **1350**, the television set **109** awaits another broadcast with additional information at step **1325.**

Referring now to FIG. 15, an electrical block diagram of a television set **1505** that receives a command signal from the remote control unit **1200** is shown, in accordance with the preferred embodiment of the present invention. The television set **1505** is identical to the television sets **108**, **109** described with reference to FIGs. 2 and 4, but with additional functions as shown in FIG. 15 that make it possible for the television set **1505** to receive the command signal and act upon it. The intercepted RF signal **249** or the cable RF signal **254** is demodulated by the RF signal demodulator **280** and decompressed by the MPEG decoder **283.** The decompressed signal is coupled to an ancillary signal decoder **1510** and an audio/video decoder **1540.** A prompt gate **1520** and an information address gate **1530** are coupled to a prompt mode function **1535** that stores the current state of the prompt mode, in response to a signal generated by the Bluetooth transmitter/receiver **290** in response to the most recently received prompt mode command from the remote control unit **1200.** The prompt gate **1520** gates a prompt presentation signal **1521** that is coupled from the ancillary signal decoder **1510** and that is either coupled or not coupled to the audio/video decoder **1540,** depending on the state of the prompt mode. In accordance with the preferred embodiment of the present invention, the ancillary signal decoder **1510** decodes

and uses a prompt image (icon) from the decompressed signal generated by the MPEG decoder **283**. In accordance with an alternative embodiment of the present invention, the ancillary signal decoder **1510** uses a prompt image (icon) that is stored in memory rather than one received in the signal **249**, **254**. The information address gate **1530** either couples a received information address to the Bluetooth transmitter/receiver **290** for transmission to the remote control device **1200** or to the subscriber unit **600** (depending on the particular embodiment), or does not couple the received information address to the Bluetooth transmitter/receiver **290**, depending on the particular embodiment of the present invention. In summary, the prompt is either presented or not, and the information address is either transmitted or not, depending on the state of the prompt mode. In an alternative embodiment of the present invention, the prompt mode function **1535** stores the current state of the prompt mode, which is set in response to a signal generated by the Bluetooth transmitter/receiver **290** in response to the most recently received prompt mode command from the selective call device **600**. The selective call device **600** sends a prompt mode command when the selective call device **600** determines a change of state of an advisory that is included in a global information portion of the protocol of the selective call communication system. The advisory comprises one or more bits of information that indicate whether the selective call communication system is capable of transmitting the additional information.

Referring now to FIG. 16, a flow chart is shown of an alternative method to control a prompt mode of the television set **109**, in accordance with the preferred embodiment of the present invention. At step **1605** the television set **109** receives and stores a location signal. This is preferably a geographic location received by a GPS (global positioning system) receiver, but can alternatively be a local channel

identification of a local television broadcaster. The use of GPS is particularly useful when the television set is a mobile or portable television set. The television set **109** determines, at step **1615**, whether the additional information is available at a location indicated by the stored location. This is done by using an algorithm and table that, in the instance of the GPS embodiment, indicates which geographic locations are within coverage of the selective call communication system accessible by the information address. In the instance of the local channel identification, the table is a table listing the identification of those local broadcasters for which their local broadcast coverage is well correlated with coverage by the selective call communication system that is accessible by the information address. When it is determined that additional information is not likely to be available, the state of the prompt mode is set to OFF at step **1620**. When it is determined that additional information is likely to be available, the state of the prompt mode is set to ON at step **1625**. After steps **1620**, **1625**, the television set **109** awaits new location information at step **1605**. In the preferred embodiment, the television set uses the method described with reference to FIG. 14 in response to the state of the prompt mode of the television set **109** to present or not present the prompt and transmit or not transmit the information address. It will be appreciated that the methods of using geographic location can be used in conjunction with the manual methods of enabling and disabling the prompt command described with reference to FIGs. 13 and 14.

Referring now to FIG. 17, an electrical block diagram of a television set **1705** that determines the prompt mode from a location is shown, in accordance with the preferred embodiment of the present invention as described with reference to FIG. 16. The television set **1705** is identical to the television set **1505** described with reference to FIG. 15, but with modifications shown in FIG. 17. Television set

1705 differs from television set **1505** in that the prompt mode function **1535** is controlled not in response to a signal from the Bluetooth transmitter/receiver **290**, but in response to a signal from a location determiner **1730.** In accordance with the option shown in FIG. 17, the location determiner **1730** receives geographic location information from a conventional GPS receiver **1720** that receives, demodulates, and decodes an RF signal intercepted by antenna **1710**. The location determiner **1730** compares the geographic location to stored locations that are within the coverage area of a selective call communication system that is accessible using the information address. It will be appreciated that the GPS receiver **1720** and associated antenna **1710** could alternatively be located external to the television set **109**.

In the alternative embodiment described above with reference to FIG. 16, instead of using the GPS location, the location determiner **1730** makes the location determination using local broadcaster identification information decoded by the ancillary signal decoder **1510**, as shown by the dotted line in FIG. 17, in conjunction with a table of "good" broadcaster identifications.

By now, it should be appreciated that a method and apparatus has been described for providing additional information about a television broadcast that allows a user interested in the additional information to acquire it easily, using a selective call device or a television remote control device to easily acquire an information address during the broadcast, when a prompt is presented during the broadcast. An advertiser can send the additional information over the selective call communication system or can post it at a URL of a computer network. The information address is then used to acquire the additional information. The information address can be stored, selected and deleted in the remote control

device or selective call device. The prompt can be disabled or enabled manually or based on location.

While several embodiments of the invention has been illustrated and described, it will be clear that changes, variations, substitutions and equivalents will occur to those skilled in the art without departing from the spirit and scope of the present invention as defined by the appended claims.